Remarks

Claims 7-10, 12 and 14 have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Specifically, the rejection indicates that the means-plus-function limitations recited in the claims are not supported by corresponding structure in the specification. This rejection is respectfully traversed for the following reasons.

In claims 7-10, 12 and 14, a number of means limitations are recited. These limitation include level position controlling means, diameter measuring means, crucible ascent speed calculating means, level position measuring means, crucible ascent speed adjustment value calculating means, adjustment value adding means, adjustment value addition proprietary judging means, averaging means, and automatic updating means. An example of each of these means is illustrated in Figure 1 and their operation is illustrated in Figure 2 and discussed in the specification at paragraphs [0027]-[0033] and [0045]. It is, therefore, clear how these means are related to each other and how they operate.

The rejection indicates that the specification fails to disclose an actual structure used to implement the means. However, it is submitted that one of ordinary skill in the art at the time of invention would have known how these means can be implemented, e.g., by hardware (circuitry), software, or some combination of hardware and software, such as a computer. As is discussed in the specification and illustrated in Figure 2, the means are utilized to perform a number calculations and/or make decisions based on a number of variables. These are exactly the type of functions that can be performed by a computer, as is generally well known to one of ordinary skill in the art.

Further, it is apparent that one of ordinary skill in the art would understand that a computer would be able to perform these functions based on the fact that the Hofstetter reference, relied upon to reject claims 7-12 and 14, while different from what is claimed in the present invention as will be discussed below, discloses a process and apparatus for controlling a melt level while pulling a single crystal by utilizing a control device (comparator) 8 and a set point generator (computer) 9 (see column 5, lines 51-59) to implement the process and control the operation of the apparatus. This disclosure provides evidence that one of ordinary skill in the

art at the time of invention would understand that calculations and decisions discussed in the present invention would be implemented by at least one of software and hardware.

In addition, it is apparent that one of ordinary skill in the art would have also been able to implement the means in hardware and/or software without undue experimentation. Figure 2, along with the disclosure in the specification, provides an understanding of how the means operate. From this disclosure, one of ordinary skill in the art would be able to implement a circuit to perform these operations, or write a computer program to implement these operations, without an undue amount of experimentation. As a result, withdrawal of this rejection is respectfully requested.

Claims 7-10, 12 and 14 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention. Specifically, the rejection indicates that the means-plus-function limitations recited in claims 7-10, 12 and 14 are not supported by corresponding structure in the specification. This rejection is also respectfully traversed for the reasons set forth above with regard to the rejection under 35 U.S.C. §112, first paragraph. That is, it would have been obvious to one of ordinary skill in the art at the time of invention to implement the means with hardware and/or software without undue experimentation. As a result, withdrawal of this rejection is respectfully requested.

Claims 7-12 and 14 have been rejected under 35 U.S.C. §102(b) as being anticipated by Hofstetter (US 5,437,242). Claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over Hofstetter in view of LaBrie (US 6,030,451).

These rejections are respectfully traversed and submitted to be inapplicable to the claims for the following reasons.

Claim 7 is patentable over the Hofstetter, since claim 7 recites an apparatus having, in part, level position controlling means for controlling a level position of a crucible via a lifting device, wherein the level position controlling means controls the level position of the crucible based on an ascent speed adjusted by an adjustment value when certain criteria are satisfied and the level position controlling means controls the level position of the crucible based on just the

ascent speed when the certain criteria are not satisfied. Hofstetter fails to disclose or suggest level position controlling means as recited in claim 7.

Hofstetter discloses an apparatus for controlling a melt level when pulling a single crystal. The apparatus includes an image-processing device 7 that determines an actual distance between a cover 5 and a surface of melt 2 by observing the reflection of the cover 5 on the surface of the melt 2 via a camera 1. The image-processing device 7 outputs an actual signal X to a control device 8 which compares the actual signal X to a predefined set point signal Y, which is proportional to the desired distance, and if a deviation is observed, the control device 8 outputs a control signal Z to adjust the height of a crucible 11, 12. (See column 5, line 25 - column 6, line 35.) Based on the above description, it is apparent that the control device 8 only controls the crucible level based on an actual level position measurement result. As a result, it is apparent that Hofstetter fails to disclose or suggest level position controlling means for controlling a level position of a crucible via a lifting device, wherein the level position controlling means controls the level position of the crucible based on an ascent speed adjusted by an adjustment value when certain criteria are satisfied and the level position controlling means controls the level position of the crucible based on just the ascent speed when the certain criteria are not satisfied.

With regard to this limitation, it is noted that the rejection indicates that this limitation is viewed as intended use and fails to give the limitation patentable weight. This indication of intended use is completely improper. This limitation is not intended use because it does not describe what the level position controlling means is used for. Instead, this limitation describes specific characteristics of the level position controlling means. In other words, this limitation explicitly recites that the level position controlling means controls the level position of the crucible based on an ascent speed adjusted by an adjustment value when certain criteria are satisfied and that the level position controlling means controls the level position of the crucible based on just the ascent speed when the certain criteria are not satisfied. There is nothing in this language that indicates an intended use of the level position controlling means within the context suggested in the rejection. If the Examiner wishes to maintain the position that this language is

intended use, it is requested that the Examiner provide some rationale to support this position other than a mere conclusory statement.

As a result, it is apparent that Hofstetter fails to disclose or suggest the present invention as recited in claim 7.

In section 11 of the Office Action, LaBrie is indicated as disclosing the use of dual optical cameras for measuring and controlling growth of a diameter of a silicon single crystal ingot. However, it is apparent that LaBrie also fails to disclose or suggest level position controlling means as recited in claim 7.

Because of the above mentioned distinctions, it is believed clear that claims 7-14 are allowable over the references relied upon by the Examiner. Furthermore, it is submitted that the distinctions are such that a person having ordinary skill in the art at the time of invention would not have been motivated to make any combination of the references of record in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 7-14. Therefore, it is submitted that claims 7-14 are clearly allowable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that there are issues remaining which must be resolved before allowance of the application.

Respectfully submitted,

Keiichi TAKANASHI et al.

By: David M. Gordon Reg. No 45,336
for Nils E. Pedersen
Registration No. 33,145
Attorney for Applicants

NEP/jmj
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
December 29, 2003